III. De Fractionibus Algebraicis Radicalitate immunibus ad Fractiones Simpliciores reducendis, deque ſummandis Terminis quarumdam Serierum æquali Intervallo a ſe diſtantibus. Auctore *Abrahamo de Moivre*, S. R. Socio.

Eruditiſſimo Viro *JOHANNI MACHIN*,
Societatis Regalis Secretario, *A. de Moivre*, S. P.

MITTO tibi excerpta quædam e Chartis meis coram Regali Societate 5° *Maii* 1720, *exhibitis, quibus eodem die manum appoſuerunt Secretarii. Pars altera harum Chartarum jam per biennium apud Cl. Præſidem repoſita fuerat; continebat autem Demonſtrationes Propoſitionum quarumdam in Libro a me Anglice emiſſo qui inſcriptus eſt,* THE DOCTRINE OF CHANCES. *Pars altera continebat explanationem uberiorem Demonſtrationum quas prior levius tetigerat. Jam cum ſæpius me inſtigaſti ut ſelectas Propoſitiones quaſdam ex his Chartis deſumptas publici juris facerem, utpote exiſtimans in illis quædam reperiri quæ ad res majoris momenti quam ſit ſpeculatio ludorum applicari poſſint; huic tuo deſiderio tandem obtempero, idque eo libentius, quo mihi videor jure aliquo a Te itidem impetrare poſſe ut pulcherrima tua inventa in Publicum proferre diutius non reluctaris.* Vale.

2 Auguſt
1722.

PROPOSITIO I.

SI ſit Fractio quælibet $\frac{1}{1-ex+fxx-gx^3\ \&c.}$, *cujus Numerator ſit data Quantitas, & Denominator ſit Multinomium utcunque compoſitum ex datis,* 1, e, f, g, &c. *& indeterminata* x, *dico Fractionem ſupradictam ad Fractiones ſimpliciores reducibilem fore.*

Caſus Primus.

Sit Fractio propoſita $\frac{1}{1-ex+fxx}$; finge Denominatorem $1-ex+fxx=0$, ſintque $\frac{1}{m}$, $\frac{1}{p}$ radices iſtius Æquationis, ſive facto $xx-ex+f=0$, ſint m, p, radices Æquationis novæ, fac $A=\frac{m}{m-p}$, atque $B=\frac{p}{p-m}$, & erit Fractio propoſita æqualis ſummæ $\frac{A}{1-mx}+\frac{B}{1-px}$.

Caſus Secundus.

Sit Fractio propoſita $\frac{1}{1-ex+fxx-gx^3}$; fingatur $x^3-exx+fx-g=0$, ſintque m, p, q, radices iſtius Æquationis, pone $A=\frac{mm}{\overline{m-p}\times\overline{m-q}}$,

B =

$B = \frac{pp}{\overline{p-m}\times\overline{p-q}}$, $C = \frac{qq}{\overline{q-m}\times\overline{q-p}}$; & erit Fractio propoſita æqualis ſummæ $\frac{A}{1-mx} + \frac{B}{1-px} + \frac{C}{1-qx}$.

Caſus Tertius.

Sit Fractio propoſita $\frac{1}{1-ex+fxx-gx^3+hx^4}$. Fingatur $x^4 - ex^3 + fxx - gx + h = 0$, ſintque m, p, q, s, Radices iſtius Æquationes, pone $A = \frac{m^3}{\overline{m-p}\times\overline{m-q}\times\overline{m-s}}$, $B = \frac{p^3}{\overline{p-m}\times\overline{p-q}\times\overline{p-s}}$, $C = \frac{q^3}{\overline{q-m}\times\overline{q-p}\times\overline{q-s}}$, $D = \frac{s^3}{\overline{s-m}\times\overline{s-p}\times\overline{s-q}}$, eritque Fractio propoſita æqualis ſummæ $\frac{A}{1-mx} + \frac{B}{1-px} + \frac{C}{1-qx} + \frac{D}{1-sx}$.

Caſus Quartus.

Sit Fractio propoſita $\frac{1}{1-ex+fxx-gx^3+hx^4-kx^5}$, fingatur $x^5-ex^4+fx^3-gxx+hx-k=0$, ſintque m, p, q, s, t, Radices iſtius æquationis; pone $A =$

$\frac{}{\times\overline{p-s}\times\overline{p-t}}$, $C=\frac{q^4}{\overline{q-m}\times\overline{q-p}\times\overline{q-s}\times\overline{q-t}}$, $D=\frac{s^4}{\overline{s-m}\times\overline{s-p}\times\overline{s-q}\times\overline{s-t}}$, $E=\frac{}{\overline{t-m}}$ $\frac{t^4}{\times\overline{t-p}\times\overline{t-q}\times\overline{t-s}}$. Eritque Fractio propoſita æqualis ſummæ, $\frac{A}{1-mx}+\frac{B}{1-px}+\frac{C}{1-qx}+\frac{D}{1-sx}+\frac{E}{1-sx}$. Lex Reductionis ita uno intuitu ſe prodit, tamque facilis eſt illius continuatio ut inutile foret illam verbis explanare.

Corollarium I.

Si Radices omnes ſint æquales, non poterit Fractio propoſita reduci ad ſimpliciores.

Corollarium II.

Si Radices aliquæ ſint æquales, aliæ vero inæquales, poterit reduci fractio propoſita ad ſimpliciores; ſit *v.g.* fractio propoſita $\frac{1}{1-ex+fxx-gx^3}$, factoque ut præſcriptum eſt $x^3-exx+fx-g=0$. Sint Radices iſtius æquationis m, p, q, quarum m & p ſint æquales: erunt fractiones ſimplices in quas reſolvitur propoſita $\frac{mm}{\overline{m-p}\times\overline{m-q}\times\overline{1-mx}}+\frac{}{\overline{p-m}}$ $\frac{pp}{\times\overline{p-q}\times\overline{1-px}}+\frac{qq}{\overline{q-m}\times\overline{q-p}\times\overline{1-qx}}$; addantur duæ priores in unam ſummam, & erit ſumma

(diviſis

(diviſis Numeratore & Denominatore per $m-p$)

$$\frac{mp-q\times\overline{m+p}+mpqx}{\overline{m-q}\times\overline{p-q}+\overline{1-mx}\times\overline{1-px}},$$ ſive

$$\frac{mm-2qm+mmqx}{\overline{m-q}|^{2}\times\overline{1-mx}|^{2}},$$ ſive $$\frac{m}{\overline{m-q}\times\overline{1-mx}|^{2}}$$

$$-\frac{qm}{\overline{m-q}|^{2}\times\overline{1-mx}|^{2}}$$ adeoque Fractiones reductæ

erunt $$\frac{m}{\overline{m-q}\times\overline{1-mx}|^{2}}-\frac{qm}{\overline{m-q}^{2}\times\overline{1-mx}|^{2}}$$

$$+\frac{qq}{\overline{m-q}|^{2}\times\overline{1-qx}}.$$

Corollarium III.

Si Fractiones ſimplices in quas reſolvitur Fractio propoſita involvant Quantitates imaginarias, tunc quicquid eſt imaginarii ſemper deſtruetur per additionem duarum vel plurium fractionum numero pari ſumptarum.

Corollarium IV.

Ex combinatione Fractionum ſimplicium, & apta limitatione Radicum, plurima ſuborientur Theoremata in quibus inerit concinnitas quædam minime aſpernanda Ex. *g*. ſit fractio propoſita $\frac{1}{1-ex+fxx-gx^{3}+hx^{4}}$, factoque ut antea $x^{4}-ex^{3}+fxx-gx+h=0$. Sint $m, p, q, s,$ Radices Æquationis, ſintque Fractiones in quas reſolvitur propoſita, $\frac{A}{1-mx}+\frac{B}{1-px}$

+

$+\frac{C}{1-qx}+\frac{D}{1-sx}$. Ponatur $q=-m$, atque $s=-p$; addantur ſimul duæ priores, itemque duæ poſteriores, & reducetur fractio propoſita ad

$$\frac{m+p-mpx}{2\times\overline{m+p}\times\overline{1-mx}\times\overline{1-px}}+\frac{m+p+mpx}{2\times\overline{m+p}\times\overline{1+mx}\times\overline{1+px}}$$

ſi vero ponatur $p=-m$, atque $s=-q$, & addantur duæ priores, itemque duæ poſteriores, reducetur Fractio propoſita ad

$$\frac{mm}{\overline{mm-qq}\times\overline{1-mmxx}}+\frac{qq}{\overline{qq-mm}\times\overline{1-qqxx}}.$$

PROPOSITIO II.

Si ſit Fractio quælibet cujus Numerator ſit data Quantitas, & Denominator ſit Trinomium vel Quadrinomium vel Quinquinomium, &c. *radicalitate non affectum & utcunque compoſitum ex datis*, 1, e, f, g, h, &c. *& indeterminata* x *atque dividatur Numerator per Denominatorem, ut habeatur Series Infinita; dico fore ut, ſi ſumantur Termini quilibet iſtius ſeriei æqualibus intervallis a ſe invicem diſtantibus, ſeries infinitæ inde reſultantes, ſummabiles futuræ ſint.*

Exemplum I.

Sit Fractio propoſita $\frac{1}{1-x-xx}$; reducatur illa ad ad ſeriem infinitam, nempe ad $1+x+2xx+3x^3+5x^4+8x^5+13x^6+21x^7+34x^8$ &c. ſumanturque termini omnes alterni, incipiendo a primo, itidemque ſumantur Termini omnes alterni, incipiendo a ſecundo, hincque conficiantur ſeries binæ,

Videlicet, $1+2xx+5x^4+13x^6+34x^8$ &c.
$x+3x^3+8x^5+21x^7+55x^9$ &c.

Fingatur Denominator Fractionis propoſitæ, $1-x-xx=0$, jam cum indices poteſtatum indeterminatæ x, in novis ſeriebus ſe invicem ſuperent communi differentia 2, pone $xx=z$, atque ope duarum æquationum $1-x-xx=0$, & $xx=z$, exterminetur x; fietque $1-3z+zz=0$; jam nunc reſtituatur x, & erit $1-3xx+x^4=0$; dividatur hæc æquatio per primam, quotiens erit $1+x-xx$; ſumantur alternatim Termini quotientis, propter Terminos alternatim ſumptos in ſerie propoſita, hincque orientur ſummæ duæ, $1-xx$, & x; conſtituantur hæ ſummæ Numeratores Fractionum duarum quarum communis Denominator ſit $1-3xx+x^4$, eruntque $\frac{1-xx}{1-3xx+x^4}$ & $\frac{x}{1-3xx+x^4}$ ſummæ reſpectivæ novarum Serierum.

Exemplum II.

Si vero deſiderentur ſummæ terminorum intervallis binis a ſe diſtantium, fiat ut prius $1-x-xx=0$, jam cum indices poteſtatum in novis ſeriebus ſe invicem ſuperunt communi differentia 3, ponatur $x^3=z$, & fiet $1-4z-zz=0$, atque reſtituto x, fiet $1-4x^3-x^6=0$; dividatur $1-4x^3-x^6$ per $1-x-xx$, quotiens erit $1+x+2xx-x^3+x^4$, cujus termini ordinatim ſumpti ad intervalla bina, tres conficient

conficient ſummas, videlicet, $1 - x^3$, $x + x^4$, $2xx$, quæ ſigillatim ſumptæ, erunt illæ Numeratores, trium Fractionum, quibus ſi apponatur communis Denominator $1 - 4x^3 - x^6$, erunt tres Fractiones, $\frac{1 - x^3}{1 - 4x^3 - x^6}$, $\frac{x + x^4}{1 - 4x^3 - x^6}$, $\frac{2xx}{1 - 4x^3 - x^6}$, ſummæ tres Terminorum omnium binis intervallis a ſe diſtantium, incipiendo reſpective a primo, ſecundo & tertio Termino; atque eodem methodo colligere licet ſummas terminorum ternis vel quaternis vel quinis intervallis a ſe diſtantibus, ſive denominator ſit quadrinomium, vel multinomium quodcunque ex terminis finitis compoſitum.

PROPOSITIO III.

Si dividatur Unitas per Trinomium utcunque compoſitum ex datis 1, e, f, g, &c. *& indeterminata* x; *dico Terminum quemvis Seriei ex hac diviſione reſultantis, aſſignabilem fore.*

Sit Trinomium $1 - ex + fxx$ finge $xx - ex + f = 0$, ſint m & p, radices Æquationis; ſit $l + 1$ locus termini deſiderati, hoc eſt exprimat l intervallum inter primum Terminum & Terminum quæſitum, fac $A = \frac{m}{m - p}$, $B = \frac{p}{p - m}$. Et erit Terminus deſideratus $\overline{Am^l + Bp^l} \times x^l$.

Eodem modo ſi dividatur Unitas per quadrinomium $1 - ex + fxx - gx^3$, pone $x^3 - exx + fx - g = 0$, ſintque m, p, q, radices Æquationis, fac $A = \frac{mm}{\overline{m - p} \times \overline{m - q}}$, $B = \frac{pp}{\overline{p - m} \times \overline{p - q}}$, $C =$

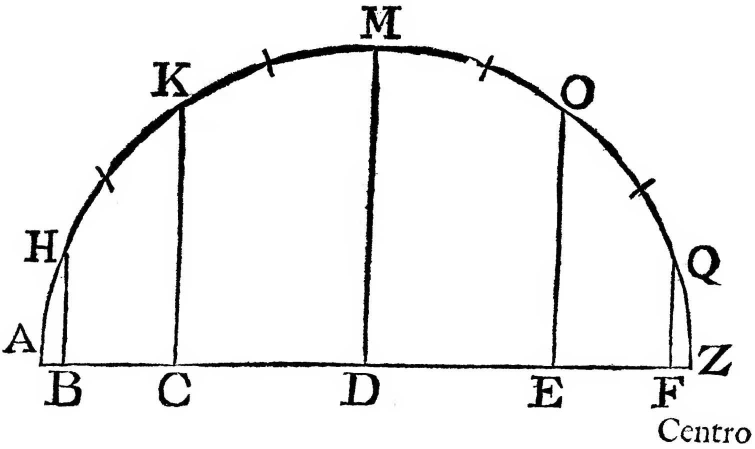
$\frac{qq}{\overline{q-m} \times \overline{q-p}}$. Et erit Terminus deſideratus $\overline{Am^l + Bp^l + Cq^l} \times x^l$, & lex eadem obtinet pro multinomiis quibuſcunque.

PROBLEMA.

A & B *quorum Dexteritates ſint in ratione data videlicet ut* a *ad* b, *ea conditione ludant, ut quoties* A *ludum unum vicerit,* B *tradat ipſi nummum unum: quoties vero* B *vicerit,* A *tradat ipſi nummum unum: & non prius ludo deſiſtant, quam eorum alter nummos omnes alterius lucratus fuerit; quæritur quantum probabile futurum ſit ut certamen intra datum ludorum numerum* x, *vel expirante illo numero, finiatur.*

Caſus Primus.

Sit n numerus nummorum quos uterque Colluſorum habeat; ſit etiam n numerus par, ponaturque a ad b habere rationem æqualitatis.



Centro D, Intervallo $DA = 1$, deſcribatur Semicircumferentia AMZ quæ dividatur in tot partes æquales quot ſunt unitates in n, tunc ex primo H, tertio K, quinto M &c. & impari quoque diviſionis termino, demittantur ad diametrum perpendicula HB, KC, MD, OE, QF &c. ponatur $Q = \frac{HB^{x+1}}{AB^{\frac{1}{2}x+1}} - \frac{CK^{x+1}}{AC^{\frac{1}{2}x+1}} + \frac{DM^{x+1}}{AD^{\frac{1}{2}x+1}} - \frac{EO^{x+1}}{AE^{\frac{1}{2}x+1}} + \frac{QF^{x+1}}{AF^{\frac{1}{2}x+1}}$ &c. donec ſinus omnes exhauriantur: quo facto, erit probabilitas certaminis finiendi intra ludos non plures quam x, ad probabilitatem non finiendi, ut $2^{\frac{1}{2}x-1}n - Q$ ad Q, accurate.

Corollarium I.

Si ſumatur pro Q Terminus primus $\frac{HB^{x+1}}{AB^{\frac{1}{2}x+1}}$ neglectis cæteris, habebitur approximatio ſufficiens niſi forte ſit x numerus valde exiguus.

Exemplum.

Sit n numerus nummorum quos uterque Colluſorum habeat $= 10$. Sit etiam $x = 76$. Si ſumatur pro Q primus terminus & negligantur cæteri, invenietur probabilitas certaminis finiendi intra ludos non plures quam 76 ad probabilitatem non finiendi ut 50747 ad 49235, ſi vero ſumatur pro Q termini duo priores neglectis cæteris, invenietur ratio probabilitatum ut 50743 ad 49247.

Coroll-

Corollarium II.

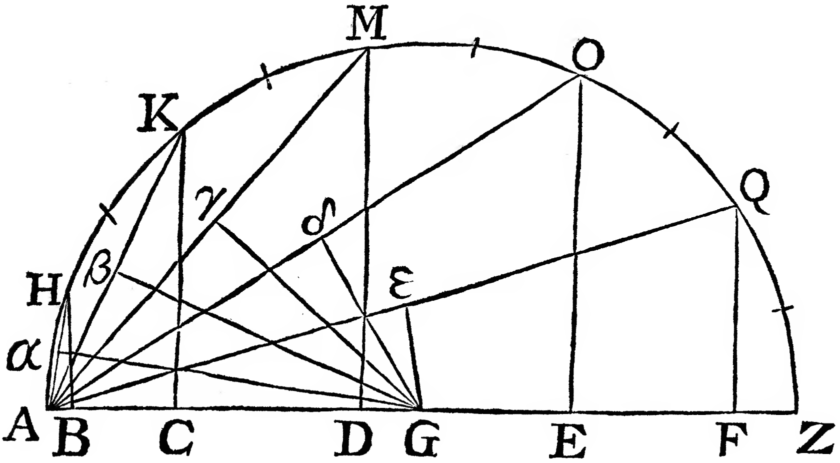
Invenire quotenis ludis, probabilitates certaminis finiendi & non finiendi erunt æquales.

Solutio.

Ponatur pro Q Terminus unicus $\frac{HB^{x+1}}{AB^{\frac{1}{2}x+1}}$, fiatque $2^{\frac{1}{2}x-1}n - Q = Q$. Et poſito n maximo numero invenietur, $x = 0.756\,nn$ proxime, aliquanto major quam $\frac{3}{4}nn$.

Caſus Secundus.

Sit n numerus impar, ponaturque a ad b habere rationem æqualitatis.



Centro G, intervallo GA deſcribatur ſemicircumferentia AMZ quæ dividatur in tot partes æquales, quot ſunt

ſunt unitates in n; tunc ex primo H, tertio K, quinto M, & impari quoque diviſionis termino, demittantur ad diametrum perpendicula HB, KC, MD, OE, QF *&c.* ex diametri extremitate A, primo ſcilicet arcui contermina, ducantur ſubtenſæ AH, AK, AM, *&c.* ad quas e Centro G ducantur perpendicula $G\alpha$, $G\beta$, $G\gamma$, $G\delta$, $G\varepsilon$, &c. ponatur

$$Q = \frac{BH^{x} \times G\alpha}{AB^{\frac{x+1}{2}}} - \frac{CK^{x} \times G\beta}{AC^{\frac{x+1}{2}}} + \frac{DM^{x} \times G\gamma}{AD^{\frac{x+1}{2}}} - \frac{EO^{x} \times G\delta}{AE^{\frac{x+1}{2}}} + \frac{FQ^{x} \times G\varepsilon}{AF^{\frac{x+1}{2}}} \text{ \&c.}$$

quo facto, erit probabilitas certaminis finiendi intra ludos non plures quam x, ad probabilitatem non finiendi, ut $2^{\frac{x-3}{2}} n - Q$ ad Q accurate.

Corollarium I.

Si ſumatur pro Q terminus primus $\frac{HB^{x} \times G\alpha}{AB^{\frac{x+1}{2}}}$ neglectis cæteris, habebitur approximatio ſufficiens.

Exemplum.

Sit n numerus nummorum quos uterque Colluſorum habeat $= 45$. Sit etiam $x = 1519$. Sumatur pro Q terminus primus neglectis cæteris, & invenietur probabilitas certaminis finiendi intra ludos non plures quam 1519 ad probabilitatem non finiendi ut 49959 ad 50441, quæ proportio eſt vero proxima.

Corol-

Corollarium II.

Invenire quotenis ludis probabilitates certaminis finiendi & non finiendi erunt æquales.

Solutio.

Ponatur pro Q Terminus unicus $\frac{HB^{x} \times G\alpha}{AB^{\frac{x+1}{2}}}$, fiatque $2^{\frac{x-3}{2}} n - Q = Q$; & poſito n magno numero, invenietur $x = 0.\ 756\ nn$ proxime aliquanto major quam $\frac{3}{4}\ nn$ contra quam ſentiebat Clariſſimus Monmortius.

Caſus Tertius.

Poſitis cæteris ut in primo caſu, ſit a ad b ratio inæqualitatis (*vid. Fig.* 1.) Pone $\frac{a^{n}+b^{n}}{\overline{a+b}|^{n}} = L$, $\frac{\overline{a-b}|^{2}}{\overline{a+b}|^{2}} = d$, $\frac{ab}{\overline{a+b}|^{2}} = r$, Fac, $1, 2r :: \frac{HBq}{AB}, m :: \frac{CKq}{AC}, p :: \frac{MDq}{AD}, q :: \frac{OEq}{AE}, s :: \frac{QFq}{AF}, t$.

Pone $Q = \frac{HB}{2rAB+d} m^{\frac{1}{2}x} - \frac{CK}{2rAC+d} p^{\frac{1}{2}x} + \frac{MD}{2rAD+d} q^{\frac{1}{2}x}$ &c. quo facto erit probabilitas ludi finiendi intra ludos non plures quam x ad probabilitatem non finiendi ut $nr^{\frac{1}{2}n-1} - 2LQ$ ad $2LQ$.

Corollarium II.

Si ſumatur pro Q Terminus primus $\frac{HB}{2r\,AB+d}\,m^{\frac{1}{2}x}$ neglectis cæteris, habebitur approximatio ſufficiens.

Caſus Quartus.

Poſitis cæteris ut iu ſecundo caſu, ſit a ad b ratio inæqualitatis (*vid. Fig.* 2.)

Pone quantitates L, d, r, m, p, q, s, t, &c. ut in tertio caſu.

Pone $Q = \frac{BH \times G\alpha}{2r\,AB+d}\,m^{\frac{x-1}{2}} - \frac{CK \times G\beta}{2r\,AC+d}\,p^{\frac{x-1}{2}} + \frac{DM \times G\gamma}{2r\,AD+d}\,q^{\frac{x-1}{2}}$ *&c.* quo facto erit probabilitas ludi finiendi intra ludos non plures quam x ad probabilitatem non finiendi ut $nr^{\frac{n-3}{2}} - 4LQ$ ad $4LQ$.

Corollarium.

Si ſumatur pro Q Terminus unicus $\frac{BH \times G\alpha}{2r\,AB+d}\,m^{\frac{x-1}{2}}$ neglectis cæteris habebitur approximatio ſufficiens.

Quemadmodum in Progreſſione Geometricâ, Terminus quilibet ad proxime præcedentem habet rationem datam, ita ſunt aliæ Progreſſiones quæ ſic conſtitui poſſunt ut aſſumptis ad libitum Terminis duobus primis, Terminus quilibet ſubſequens ad duos proxime præcedentes habeat rationes datas, hujuſmodi eſt ſubjecta Series, A B C D E F

$1 + 3x + 7xx + 17x^3 + 41x^4 + 99x^5$, &c. in qua

$C = 2Bx + 1Axx$

$D = 2Cx + 1Bxx$

$E = 2Dx + 1Cxx$

$F = 2Ex + 1Dxx$ &c.

Quantitates autem Numerales 2 + 1 *ſimul ſumptas ſubque propriis ſignis connexas appellare licet Indicem Relationis.*

Eodem modo conſtitui poſſunt ſeries aliæ in quibus aſſumptis ad libitum Terminis tribus primis, Terminus quilibet ſubſequens ad tres proxime præcedentes habeat rationes datas; hujus generis eſt ſubjecta Series.

A B C D E F

$1 + 2x + 3xx + 10x^3 + 34x^4 + 97x^5$ &c. in qua

$D = 3Cx - 2Bxx + 5Ax^3$

$E = 3Dx - 2Cxx + 5Bx^3$

$F = 3Ex - 2Dxx + 5Cx^3$ &c.

Quantitates autem Numerales 3 − 2 + 5 *ſimul ſumptæ ſubque propriis ſignis connexæ, componunt Indicem Relationis.*

Sunt aliæ ſeries in quibus Relatio ſit ad quatuor, vel ad quinque, vel ad ſex Terminos præcedentes, &c.

Series autem omnes hujus generis recurrentes appellare licebit propter Relationem Terminorum perpetuo recurrentem.

PROBLEMA II.

In ſeriebus recurrentibus, ex datis Terminis duobus primis, ſi relatio ſiat ad duos præcedentes; vel *datis Terminis tribus primis, ſi relatio ſiat ad tres præcedentes,* &c. *dato etiam indice relationis, invenire ſummam Terminorum quotlibet quorum numerus datus ſit.*

Problema ſolvitur in Tractatu noſtro qui inſcribitur, *The Doctrine of Chances.*

PROBLEMA III.

Aſſumptis ad libitum ſeriebus quotcunque recurrentibus; Terminiſque, iiſdem intervallis a principio ſerierum diſtantibus, in ſe invicem multiplicatis, invenire ſummam ſeriei ex hac multiplicatione reſultantis.

INVESTIGATIO.

I° Proponantur ſeries duæ, ſitque $m + n$ Index Relationis in prima ſerie, atque $p + q$ Index Relationis in ſecunda, ex primo Indice $m + n$, formetur Æquatio $xx - mx - n = 0$, ex ſecundo Indice $p + q$, formetur Æquatio $yy - py - q = 0$, pone $xy = z$. Atque ope trium iſtarum Æquationum, expungantur x & y, & orietur Æquatio

$$z^4 - mp\,z^3 \begin{array}{l} - mmq \\ - npp \\ - 2nq \end{array} zz - mnpq\,z + nnqq = 0.$$

in qua deleto primo termino z^4, mutatis ſignis omnibus, atque poſito $z = 1$, obtinebitur Index Relationis, quo obtento, ſeries reſultans facile ſummabitur; II° eodem modo procedere licet, ſi dentur ſeries tres vel quatuor &c. recurrentes.

Dum ſuperiores paginæ prælo ſubjiciebantur, incidi fortuito in Acta Leipſ. *annorum* 1702 *&* 1703, *quibus comperi Cla.* Leibnitium *eadem fere methodo ante me uſum fuiſſe qua hic utor in reducendis Fractionibus Algebraicis ad ſimpliciores, quod monitum velim ut a me avertam vel minimam ſuſpicionem, aliena mihimet arrogare voluiſſe; Propoſitio autem qua id præſtitimus æque ac Propoſitio noſtra tertia, ambæ deducuntur tanquam Corollaria ex altera Propoſitione maxime generali quam exhibuimus coram Regali Societate,* Maii 5° 1720; *Propoſitio ſic ſe habet.*

Data ſerie quâvis recurrente quarum Termini quotlibet primi ad libitum ſumantur; dato etiam Indice Relationis Terminorum ſequentium ad præcedentes, invenire Terminum quemlibet aſſignatum in hac ſerie, priuſquam ſumma ſeriei ſit cognita.

Qui autem rite perſpexerit Solutionem Problematis hic adducti, is utique percipiet illam pendere a Propoſitione noſtra generali, cujus demonſtrationem ſimulque modum inveſtigationis brevi ſpero publici juris faciam.
